Nutrition Briefs

Linking Multiple Sectors for Effective Planning & Programming

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FOREWORD

Nutrition is both a cause and an effect of many of the key development challenges facing the countries of Eastern, Central, and Southern Africa (ECSA). These range from ensuring child survival to improving maternal health; from broadening education to increasing labor productivity; re-orienting agricultural policies to modernizing food processing and distribution; and from reducing HIV/AIDS rates to increasing economic growth rates. There is increasing evidence that integrating nutrition into policies and interventions targeted at these areas is one key for success. In fact, with 30% or more of the region's population suffering from one or more types of chronic and severe malnutrition, the long-term effectiveness of public policy in *any* area may depend on whether the problem of nutrition is adequately addressed.

These Nutrition Briefs provide background information for policymakers on why and how to integrate nutrition into policies, regulations, and programs in key sectors. The goal is not to provide exhaustive technical detail, but rather, to begin a dialogue on nutrition, thus providing information that can be adapted to suit the diverse needs and situations of those who make and implement public policy. The series will be updated and expanded over time to reflect the changing priorities and realities of the pressing nutrition problems in the region.

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The Heavy Burden of Malnutrition

Malnutrition imposes a substantial burden on the people of eastern, central, and southern Africa. Most households have insufficient food in terms of quantity, quality, and utilization. This compromises their nutritional status, diminishes their potential for growth and good health, increases their burden of disease, reduces their educational and economic prospects, and shortens their lives. Yet, nutrition programs lack the financial and political support they deserve, especially given their effectiveness and relative low cost.

The burden of malnutrition is high for the individuals, communities, and economies of eastern, central, and southern Africa (ECSA). For millions, inadequate nutrition means mental retardation, physical disability, increased vulnerability to serious and chronic illness, diminished educational and economic prospects, and early death.

Because many of the effects of malnutrition are cumulative over a lifetime, children who are malnourished often enter adulthood with diminished mental and physical capacities. The long-term effect is an increased burden of disease and decreased labor productivity, which hamper countries' overall growth and development.

Malnutrition is therefore part of a self-reinforcing cycle that also includes poverty, high fertility, and poor health. In fact, breaking this cycle is essential to sustaining the significant achievements made in recent decades in child survival and health.

Who Is Affected?

Many Africans are placed at risk of severe malnutrition and starvation by war, famine, and other emergencies that disrupt food supplies. Yet chronic malnutrition is pervasive even where food supplies are adequate. A third to half of the population of ECSA suffers nutritional deprivation, including protein-energy malnutrition and deficiencies of vital micronutrients such as iodine, vitamin A, and iron (see page 2).

Mild to moderate malnutrition reduces people's capacity for normal growth, development, and function. The effects can be subtle and, many times, invisible, but the impact is often irreversible. That is why malnutrition is called the "silent emergency."

> The malnutrition crisis…is, first and foremost, about death and disability of children on a vast scale, about women who become maternal mortality statistics partly because of nutritional deficiencies and about social and economic costs that strangle development and snuff out hope.
>
> —UNICEF 1998

In the ECSA region, as elsewhere, women of reproductive age and children are particularly vulnerable to the destructive effects of malnutrition. Malnourished children are less resistant to infection, and, because their immune response is hampered by a lack of body stores of nutrients, their illnesses are longer and more severe. In fact, malnutrition plays a role in half of the 12 million child deaths that occur each year in the developing world.

Malnutrition also increases maternal mortality rates. In many ECSA countries, almost half of all pregnant women suffer from iron-deficiency anemia, and the figure may be much higher. Malnutrition during pregnancy causes still births and birth defects and mental retardation.

A clear relationship also exists between nutrition and HIV/AIDS, which now infects over 12 million people in the region. Poor nutrition increases the heightened susceptibility of HIV-infected persons to illness and secondary infection. Improved nutrition slows the progression of HIV to AIDS and may affect transmission of HIV. Mother-to-child transmission, during pregnancy, labor, and breastfeeding, causes almost all new HIV infections among children.

Improved nutrition for women and children must be a priority for all countries, not only to lessen the burden malnutrition exacts today, but also to secure the promise of improved health and economic well-being for tomorrow.

An Overview of Malnutrition

The Causes

Malnutrition is the product of a number of factors. The International Conference on Nutrition classifies them as follows:

- **Immediate causes:** inadequate dietary intake and disease.
- **Underlying causes:** insufficient food available to families (household food insecurity), inadequate care of women and children, insufficient health care, and an unhealthy environment.
- **Basic causes:** inadequacies in educational, political, and economic systems and problems with the availability and control of resources.

A Food Security Crisis

Up to 40 percent of households in ECSA lack food security, defined as access by all people, at all times, to sufficient food. Food insecurity can result in the loss of fat stores, micronutrient malnutrition, chronic undernutrition, extreme seasonal fluctuations in weight, and decreased work capacity. Women are particularly vulnerable to these effects.

Household food security depends on access to food, as well as the availability and utilization of food. Four factors are determinant:

- **Seasonal fluctuations in food availability:** Nutritional stress is highest during the wet season and just before the harvest, because food supplies are low and energy expenditures are high.
- **Quality of the family diet:** Poor diets are low in protein, limited in variety, and deficient in essential vitamins and minerals.
- **Intrahousehold distribution of food:** In many homes, women eat last and least, despite the fact that they work longer hours and are responsible for all food preparation. African women have been shown to consume less protein and fewer micronutrients than African men.
- **Cultural beliefs and customs:** Nutritional stress can be compounded by norms and taboos that limit the intake of foods that contain important nutrients, particularly during pregnancy.

Types of Malnutrition

Malnutrition takes many forms, which often appear in combination and contribute to each other. Some types result from a lack of adequate food intake, but the more prevalent forms are caused by a lack of essential vitamins and minerals.

Protein-energy malnutrition, the inadequate consumption of protein and energy, inhibits proper growth and is most often poverty-related. The primary symptom is low height for age, or stunting, which affects about one-third of children in the ECSA region.

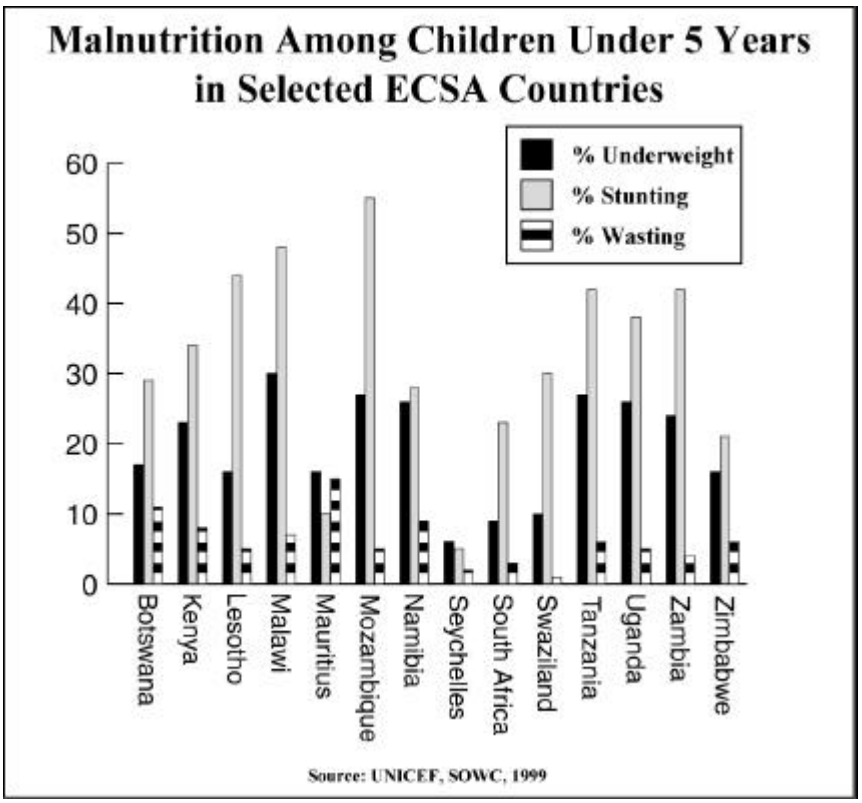
Iron deficiency anemia is the most common nutritional deficiency worldwide, affecting 2 billion people in 1998, including about half of all children under age 5 and half of pregnant women in the region. Even mild anemia can cause low birthweight, impaired immunity, and reduced physical and mental capacity. Promising solutions include control of parasitic infections and iron supplements.

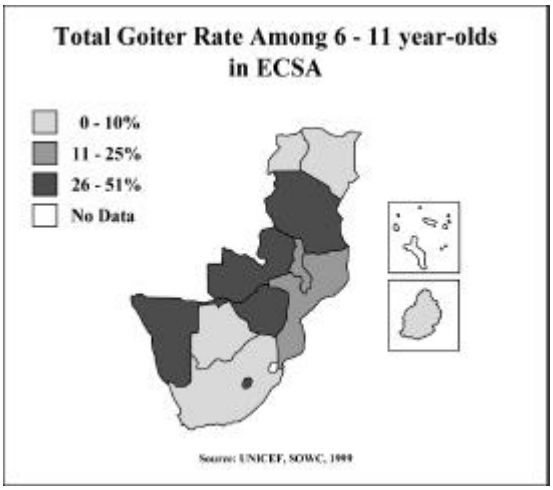
Vitamin A deficiency increases children's vulnerability to infection and increases the severity of illness, contributing to 23 percent of childhood deaths. It affects about a third of all children in the region and is the leading cause of blindness among children. The condition, which also affects many women of reproductive age, has been linked to higher rates of maternal mortality. Vitamin A supplementation can effectively reverse the most immediate effects, for example, reducing deaths among children with measles by two-thirds.

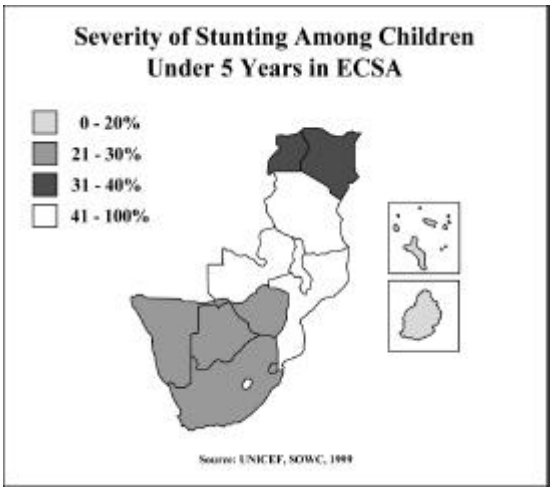
Iodine deficiency is the most important cause of preventable brain damage and mental retardation, with most damage occurring before birth. Goiter — the most visible sign of iodine deficiency — affects as many as 40 percent of 6- to 11-year-olds in some countries in ECSA. However, joint efforts by international health agencies and food manufacturers to increase consumption of iodized salt have significantly decreased the risk of iodine deficiency in recent years and demonstrated the power of concerted action to improve nutrition.

Zinc deficiency in children impairs growth and increases susceptibility to infection, particularly diarrhea, acute respiratory infections, and pneumonia. In women, zinc deficiency has been associated with complications in childbirth. Zinc also appears to play a role in the body's ability to use vitamin A and is effective in reducing the severity of diarrhea. The prevalence of zinc deficiency is unknown, but it is assumed to be a problem where other types of malnutrition are prevalent.

A Snapshot of Malnutrition in the Region







Vitamin A Deficiency, Select Countries

Country	Subclinical Vitamin A Deficiency among Children (% of children under age 5)[a]
Namibia (1992)	20.4
South Africa (1994)	30.0
Botswana (1994)	32.5
Kenya (1994)	33.0
Tanzania (1984)	45.3
Zambia (1997)*	65.7

a. Serum Retinol <0.7mol/L. Prevalence rates > 20% indicate a serious problem.

Source: Third Report on the World Nutrition Situation, Geneva, ACC/SCN, 1997.
*National Food and Nutrition Commission, National Survey on Vitamin A Deficiency in Zambia, 1997.

Successful Nutrition Programs: Lessons Learned

Integrate approaches to address the many causes of malnutrition

Many people suffer from numerous and concurrent health and nutrition problems. Using a variety of strategies and interventions can help target the multiple causes of malnutrition in specific settings, as can refocusing social and community-based services on nutrition.

Strike a balance between bottom-up and top-down approaches

Participatory approaches at the household and community levels can be particularly effective in changing key behaviors that affect nutrition. But some interventions, such as food fortification, involve broader strategies and complex technologies and require more top-down approaches.

Involve those directly affected and stress the benefits to them

The people who suffer, or whose children suffer, from malnutrition must become involved in addressing their nutritional problems. Finding the appropriate mix of available interventions requires use of the "Triple A" approach — a continuous cycle of **A**ssessment, **A**nalysis of the situation, and **A**ction using appropriate approaches and interventions.

Take advantage of periods of illness and convalescence to provide nutrition information

Nutrition information can be provided whenever people come into contact with the health system. For example, women can be counseled about good nutrition during prenatal and postpartum care. Mothers can be educated about appropriate child feeding during their children's sick visits.

Support the efforts of families and communities

Households and communities will need outside support from governments, nongovernmental organizations (NGOs), and others to find and implement effective solutions to their nutritional problems.

Further improvements in the health and overall well-being of most Africans will depend on increased awareness and use of the simple, relatively low-cost tools and methods now available to improve nutrition status significantly.

Better Health through Improved Nutrition

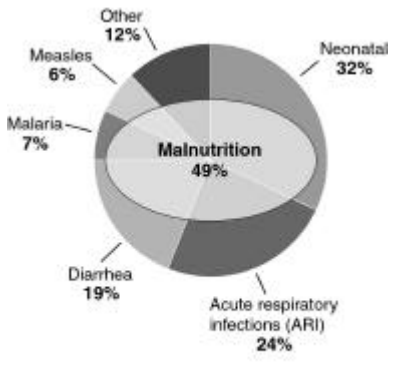
Chronic malnutrition affects more than a third of children in many eastern, central, and southern African countries, increasing the incidence, duration, and severity of childhood illness and contributing to childhood deaths. Malnutrition also diminishes the health and well-being of millions of adults in the region, particularly women of reproductive age. Improving the nutritional status of children and women is essential for improving the health and socioeconomic prospects of future generations.

Chronic malnutrition halts growth in children, and 40 percent or more of children in many countries of eastern, central, and southern Africa (ECSA) are stunted (low height for age), a key measure of chronic malnutrition. Another general indicator of the prevalence of malnutrition is the prevalence of iron deficiency anemia, the most common nutritional disorder in the world. In some countries, anemia strikes 40 percent of children under 5, over 30 percent of the general population, and up to 80 percent of pregnant women.

Such pervasive malnutrition increases the risk and severity of infectious disease in the region, particularly among children and women of reproductive age. In fact, malnutrition is a contributing factor in about half of all childhood deaths (see graph).

Malnutrition is not only a cause of illness, it is also an effect. Many diseases cause appetite loss and interfere with the body's ability to utilize food. This is true of diarrheal disease, which reduces food intake by reducing intestinal absorption. It is also true of parasitic worms, which infect more than a billion people worldwide, causing iron deficiency, anemia and retarding growth in older children. A significant cause of these conditions is inadequate access to safe water, which is a problem in some areas of the region (see page 2).

Leading Causes of Childhood Death in Developing Countries



Source: World Health Organization, 1998

Malaria is another leading cause of malnutrition. In particular, infants of women who contract it during pregnancy (when they are more susceptible) can suffer low birth weight and anemia.

Furthermore, key nutrients are interactive and interdependent: the negative impact of the malnutrition-infection relationship are compounded in the presence of more than one type of malnutrition or illness.

A Crisis for Child Health

The effects of malnutrition are particularly devastating for infants and young children. The problems associated with chronic micronutrient deficiency are well-known: blindness from vitamin A deficiency, goiter and mental impairment from iodine deficiency, and anemia from iron deficiency.

Only recently, however, has it become clear that even more moderate forms of micronutrient malnutrition can substantially increase the rates of childhood illness and death.

In fact, childhood mortality increases exponentially with lower nutritional status. For example, vitamin A deficiency alone contributes to 23 percent of childhood deaths, primarily because it reduces children's resistance to diarrhea, which kills 2.2 million children a year, and to measles, which kills nearly 1 million a year. This underscores not only the importance of adequate nutrition but also of fully immunizing children against vaccine-preventable diseases.

The Health Effects of Malnutrition

Protein-Energy Malnutrition

- Stunting (low height for age)
- Decreased resistance to infection and disease
- Increased child mortality
- Wasting (marasmus)
- Kwashiorkor (i.e., a syndrome characterized by body and hair changes and swelling of the arms and legs)

Iron Deficiency

- Decreased resistance to infection and disease
- Complications during pregnancy
- Spontaneous abortion, stress of labor, delivery complications
- Low birth weight and increased infant mortality
- Fatigue and apathy
- Lowered work productivity
- Vitamin A deficiency
- Impaired immune system
- Increased risk for infection, including HIV and reproductive tract infections
- Corneal scarring and, in severe cases, blindness and death
- Increased work absenteeism and lowered productivity

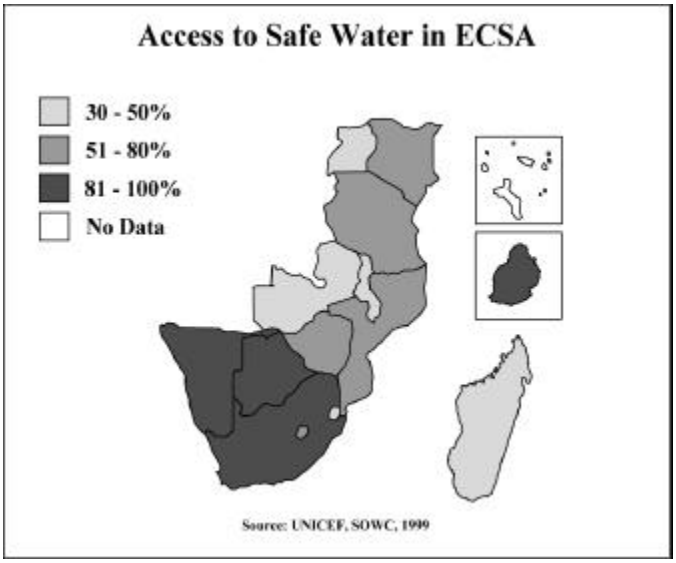
Iodine Deficiency

- Spontaneous abortion; stillbirth
- Impaired fetal brain development
- Increased infant mortality
- Goiter
- Cretinism
- Reduced mental capacity and productivity

Zinc Deficiency

- Spontaneous abortion; stillbirth
- Intrauterine growth retardation, congenital malformation, pre-term delivery, reduced maternal-fetal transport
- Labor/ delivery complications, fetal distress, increased neonatal mortality
- Low birth weight
- Impaired immune system
- Impaired growth, learning, and mental development

Source: J. Baker et al., The Time to Act: Women's Nutrition and Its Consequences for Child Survival and Reproductive Health in Africa, SARA/AED for USAID, 1996.



Low Birth Weight and Infant Mortality, 1997

Country	Low Birth Weight (percent)	Infant Mortality (per 1,000 live births)
Malawi	20	135
Mozambique	20	130
Namibia	16	58
Kenya	16	57
Tanzania	14	92
Zimbabwe	14	53
Zambia	13	112
Uganda	13	86
Mauritius	13	20
Lesotho	11	95
Botswana	11	39
Swaziland	10	66
Seychelles	10	14
South Africa	No data	49

Source: UNICEF, SOWC, 1999

A Scourge for Women

Women's nutritional status is compromised by a number of factors, many of which relate to their lower socioeconomic status. In many areas, women receive less and lower-quality food from birth, which helps perpetuate the cycle of poor health, inadequate diet, early and frequent pregnancy, and continued poverty that typifies the lives of many women in the region.

Women are healthier and better nourished when they are not overworked, when they have access to education and employment, and when they receive sufficient support and care from their families and communities during and after pregnancy. When women are healthier and better nourished, so are their children.

Women's nutrition is greatly affected by disease. Hookworm infection leaves women anemic, anorexic, and fatigued. Malaria destroys red blood cells and leads to anemia. And increasing numbers of women in the region are infected with HIV/AIDS.

Several other factors combine to decrease women's nutritional status:

- **Unequal division of labor:** Women spend nearly twice as much time as men on family and household maintenance, beginning in childhood and continuing through pregnancy and the postpartum period. Such byproducts of underdevelopment as inadequate water supplies, lack of electricity, and poor sanitation increase the burden of work for many women. Despite their heavy workloads, however, women often consume fewer calories and less protein than men.
- **Discrimination in education and employment:** Nutrition is directly related to income, and women who earn less are less able to provide an adequate diet their families. Girls often receive less schooling than boys, which reduces their lifetime income prospects and those of their children.
- **High fertility rates:** The risk of pregnancy-related death increases with frequent childbearing, in part because the mother cannot regain lost fat and nutrients. The average woman in the region — which has some of the highest fertility rates in the world — bears between five and seven children.
- **Adolescent pregnancy:** Adolescent pregnancy increases the risks of low birth weight, complications with pregnancy and delivery, and maternal mortality.

Appropriate Child Feeding

- Young children who are growing properly gain weight rapidly and should be weighed monthly. A failure to gain weight is an early sign of malnutrition or illness.
- Breastmilk alone is the best food for the first 6 months of a child's life. After 6 months of age, children need a variety of complementary foods, in addition to breastmilk.
- Children should be fed three to five times daily from the age of 6 months to 2 years.
- Adequate amounts of vitamin A help children resist illness and prevent visual impairments.
- Iron-rich foods (such as liver, lean meats, and eggs) help children develop physically and mentally.
- Iodized salt helps prevent certain disabilities and developmental impairments associated with iodine deficiency.
- Children need to continue to eat regularly during illness, and they need one extra meal each day for a week following an illness. Children with diarrhea should be given oral rehydration salts (ORS) in addition to breastmilk and regular foods.

The Generational Legacy

For many children, the devastating health effects of malnutrition begin in the womb. Pregnant and nursing women need care and support from their families and communities to ensure a healthy pregnancy and delivery and to provide adequate nutrition and nurture to their children (see box). This comes in the form of food, relief from labor, and health care.

Numerous studies indicate that, in general, African women do not take in sufficient calories during pregnancy to ensure their health or the health of their children. In fact, many women eat *less* than normal, despite their bodies' increased nutritional needs. In part, this is a reflection of beliefs that eating too much or eating certain foods will complicate labor and delivery.

The consequences of malnutrition during pregnancy can be severe, both for the women and for their children. Anemic women are more likely to die of postpartum hemorrhage than non-anemic women. Stunted women are at greater risk of obstructed labor, and women deficient in vitamin A are more susceptible to infection.

Children born to malnourished women are more likely to have low birth weight, which decreases their chances of ever attaining full growth and increases their mortality risks. In addition, few women reduce their heavy physical workloads during pregnancy or after childbirth. Heavy physical labor has been shown to have a negative effect on birth weight.

As a result of these interrelated factors, nearly 600,000 women die annually worldwide from pregnancy-related causes. When a woman dies, her infant is highly likely to die within a year.

Lessons Learned

Integrate Child Nutrition and Health Programs

Integrating nutrition interventions into broader child health programs can be a doubly effective means of improving child health and survival because it can reduce malnutrition among children and simultaneously lessen the negative impact of illness. For example, recent studies indicate that children who receive zinc supplements showed a decrease in malaria-related fever, that giving vitamin A to children with measles reduces death from that disease by two-thirds, and that vitamin A can also decrease the severity of acute respiratory infection (ARI) and diarrheal disease.

Integrated Management of Childhood Illness (IMCI) is a strategy that combines improved case management for sick children with nutrition, immunization, and other programs that influence child health. The World Bank estimates that IMCI could reduce child deaths in areas of high mortality by 50–70 percent.

Improve Feeding Practices

Appropriate feeding of children helps ensure proper nutrition, avert stunting, and prevent illness and death. Proper feeding is particularly important during and after illness, because of the synergistic relationship between nutrition and infection. Nutrition education programs can motivate health providers and mothers to follow appropriate feeding practices, including to actively encourage children to eat during and after illness.

Prioritize Women's Health Issues

In the short term, there are three priorities for improving women's nutrition. The first, which is particularly important, is to postpone the first pregnancy and ensure adequate child spacing. The second is to prevent transmission of HIV/AIDS and treat other sexually transmitted infections (STIs). The third is to better meet the needs of pregnant and lactating women, including those related to diet, prenatal and postpartum care, and decreased workloads (among others).

Encourage Community-Based Education Programs

Community-based programs that provide interpersonal counseling about nutrition are successful in improving feeding practices and have led to improved nutritional status for children. Such programs stress maternal nutrition, breastfeeding, appropriate complementary foods, and active feeding of sick children, among other things.

A key to success for such programs is a thorough assessment of current causes of child malnutrition at the household and community level. Many effective programs also are characterized by broad community participation, the use of local institutions, well-trained and qualified staffs, the integration of a variety of activities, and flexibility.

Adequate Feeding Reduces the Risks of HIV Infection

HIV decreases the nutritional status of infected persons and increases their susceptibility to illness and secondary infections. HIV/AIDS also decreases the food security of affected households. On the other hand, improved nutrition strengthens the immune system and can delay the progression of AIDS. HIV infection rates are increasing in eastern, central, and southern Africa, especially among women and from mothers to their children. The challenge for policy makers is to slow the spread of HIV infection while continuing to improve nutrition, especially through breastfeeding.

The relationship between human immunodeficiency virus (HIV) and nutrition is clear: HIV reduces the appetites of infected persons and hampers their nutritional absorption, increasing their already heightened susceptibility to illness and secondary infection. On the other hand, improved nutrition can delay the progression of HIV and may even affect transmission.

Furthermore, households affected by HIV/AIDS experience reduced food security. Children who lose one or both of their parents to the disease often suffer severe malnutrition and increased risk of HIV/AIDS and other diseases.

The countries of east, central, and southern Africa (ECSA) have some of the highest HIV rates in the world, with over 10 percent of adults already infected in most countries (see page 2). The infection continues to spread rapidly, particularly among women. In most countries in the region, over half of new infections now occur in women, and UNAIDS estimates that more than 30 percent of pregnant women are now infected with HIV. This has made mother-to-child transmission of HIV during pregnancy, delivery, and breastfeeding a growing problem.

The challenge to policy makers in the region is to slow the spread of HIV while improving nutrition for all, particularly those affected by the disease. Particular emphasis must be given to reducing infants' risks of contracting HIV while continuing to promote and protect the ability of all women, including those who are HIV-positive, to breastfeed if they choose.

> HIV is now the single greatest threat to future economic development in Africa. AIDS kills adults in the prime of their working and parenting lives, decimates the workforce, fractures and impoverishes families, orphans millions, and shreds the fabric of communities.
>
> —Callisto Madavo,Vice President, Africa Region, World Bank, at the International Conference on AIDS in Africa (ICASA), September 1999

Who Is Affected?

Of the 5.8 million people worldwide infected with HIV during 1998, 70 percent live in Sub-Saharan Africa, including 90 percent of the 590,000 children newly infected during the year. The region was home to 80 percent of AIDS deaths during 1998, and to 83 percent of all AIDS deaths since the pandemic began in the late 1970s. The bulk of new infections continue to be concentrated in eastern and, especially, southern Africa.

In Botswana, Namibia, Swaziland, and Zimbabwe, 20-26 percent of people between ages 15 and 49 have HIV or AIDS. In Botswana, where more than 25 percent of all adults are infected, life expectancy has been reduced to just over 40 years, compared to 70 years without AIDS.

Zimbabwe has been especially hard-hit. In 23 of 25 surveillance sites around the country, between 20 and 50 percent of pregnant women were found to be infected with HIV in 1997. One-third of these women were expected to pass the virus to their babies.

More than 10 percent of adults are infected in Kenya, Malawi, Mozambique, South Africa, and Zambia. One of every seven new infections in Africa occurred in South Africa during 1998.

HIV is reversing two decades of steady gains in combating infant and child death. For example, between 2005 and 2010, 61 of every 1,000 infants born in South Africa are expected to die before their first birthday; in the absence of AIDS, the number would have been 38 per 1,000. In addition, AIDS is making orphans of millions of children, who subsequently face a greater likelihood of poor care, malnutrition, HIV/AIDS and other diseases, and death.

Teenage HIV Infections in Malawi

A recent study in Malawi found that the annual rate of new HIV infection in teenage girls was as high as 6 percent, compared to under 1 percent for women over age 35. Although this figure may appear to be low, it is an *annual* infection rate, which indicates that a significant proportion of teens will be infected before adulthood.

The Role of Nutrition

Good nutrition can decrease the wasting that accompanies advanced HIV infection and may prevent progression of the disease by strengthening the immune system. Deficiencies of certain micronutrients may speed progression of HIV infection to AIDS and, subsequently, death, although the evidence is inconclusive.

For example, in Malawi, children born to HIV-infected women who were deficient in vitamin A faced an increased risk of dying during their first year (93 percent died compared to 14 percent for those born to HIV-infected mothers replete with vitamin A). Although recent research in Tanzania, South Africa, and Malawi indicates that vitamin A supplementation for pregnant HIV-positive women does not help prevent mother-to-child transmission, the supplements did reduce pre-term delivery and low birth weight, both beneficial to the infants.

Mother-to-Child Transmission

HIV-positive mothers can transmit the virus to their infants during pregnancy and delivery and through breastfeeding. About 20 percent of HIV-positive women transmit the virus during pregnancy and labor (6 and 14 percent, respectively) in the absence of antiretroviral drug therapy or other special precautions. An additional 10-15 percent transmit the virus through breastfeeding during their child's first two years of life.

Mother-to-child transmission causes about 10 percent of all new HIV infections in Africa and nearly all pediatric HIV cases. The high and increasing prevalence of HIV/AIDS among women under age 25 makes mother-to-child transmission a particularly urgent issues for policy makers in the region.

The challenge is to reduce infants' risks of contracting HIV while continuing to promote, support, and protect breastfeeding among HIV-positive women who choose to breastfeed and among those who don't know their HIV status.

HIV/AIDS in ECSA

Country	People with HIV/AIDS, end 1997	
	Adults and Children	Adult rate (percent)
Botswana	190,000	25.1
Kenya	1,600,000	11.6
Lesotho	85,000	8.4
Madagascar	8,600	0.1
Malawi	710,000	14.9
Mauritius	*	0.1
Mozambique	1,200,000	14.2
Namibia	150,000	19.9
Rwanda	370,000	12.8
Seychelles	*	*
South Africa	2,900,000	12.9
Swaziland	84,000	18.5
Tanzania	1,400,000	9.4
Uganda	930,000	9.5
Zambia	770,000	19.1
Zimbabwe	1,500,000	25.8

* = no data.
Source: Report on the Global HIV/AIDS Epidemic. Geneva, UNAIDS, June 1998.

The Impact on Food Security

HIV/AIDS affects household food security in two ways. First, the disease weakens and kills adults in their prime income-producing years, which decreases household income. Second, agricultural production is reduced by the extra demands of caring for ill family members or doing the work of ill or deceased family members.

For example, in Kenya, farmers shifted from cash to subsistence crops when they lost agricultural labor. Bananas were not mulched or replanted in areas of Tanzania heavily impacted by HIV/AIDS, which reduced both yields and soil fertility.

The disease also forces many affected households to liquidate their assets to meet the immediate need to buy food or medicine or to pay funeral expenses. HIV/AIDS also increases rural-to-urban migration, as households attempt to replace income lost to illness and death.

In many cases, households affected by HIV/AIDS face seasonal, episodic, or chronic food shortages. The impact on infants, young children, pregnant or lactating women, and the elderly can be especially severe.

AIDS Orphans

Children who lose one or both of their parents to AIDS experience catastrophic loss and suffering, which begins even before a parent dies. Because of the stigma attached to HIV/AIDS in many places, having an infected family member may expose these children to social exclusion and discrimination, which can affect their access to health care and adequate nutrition.

For example, the symptoms of illness or malnutrition among these children (i.e., wasting) may be mistakenly attributed to HIV/AIDS, and the children may not be provided potentially lifesaving care or treatment.

> The time is now to declare AIDS in Africa a state of emergency requiring emergency type efforts and resources.
>
> — Peter Piot, Executive Director, UNAIDS, at the International Conference on AIDS in Africa, September 1999

After they lose a parent, these orphans are particularly vulnerable to hunger and malnutrition, abuse and exploitation, illness, and death. They also face dramatically higher risks of HIV infection.

In part, this is because the AIDS epidemic has stretched the ability of extended family networks to adequately provide for orphans. Because AIDS generally strikes adults in their prime, many AIDS orphans are being cared for by grandparents, other elderly relatives, or siblings who are still children themselves. These caregivers may simply be unable to meet the needs of these orphans (particularly infants who need to be adequately breastfed).

Moreover, when extended families cannot afford to send all the household children to school, orphans are often the first to be denied education. The lack of education, particularly during early childhood, hampers these children's development and reduces their lifetime earnings potential, diminishing not only their nutritional prospects but those of their offspring for generations to come.

Promising Approaches

A number of studies are underway to explore the full potential of some promising approaches for reducing transmission of HIV, particularly from mother to child, and for slowing the progression of HIV to AIDS and death.

Overall, of course, a governmental commitment to prevent HIV transmission is critical to any effort. In Uganda, for example, which once had the highest HIV infection rates in the world, concerted action has resulted in a steady decline in new infections during recent years.

Micronutrient Supplementation

A growing body of evidence indicates not only that early HIV infection is accompanied by certain micronutrient deficiencies but also that such deficiencies play a role in both the transmission of HIV and its progression. Vitamin A and zinc, for example, are known to play a critical role in the body's immune response.

In Tanzania, providing multivitamin supplements to HIV-positive pregnant women reduced the risks of low birth weight to their children by 44 percent. Also in Tanzania, vitamin A supplements increased the life expectancy of HIV-infected children.

Further tests are underway to determine whether the link between maternal vitamin A deficiency and HIV transmission is causal or coincidental and to examine the effectiveness in slowing HIV transmission of vitamin A supplementation during pregnancy.

Antiretroviral Therapy

The antiretroviral drug zidovudine (AZT) is effective in reducing intrauterine transmission of HIV by up to two-thirds when administered during pregnancy to women who do not later breastfeed. However, this treatment is quite expensive — several hundred dollars per course — and the search is on for less costly treatments, including less expensive drugs and the use of smaller doses of AZT.

A more cost-effective preventive therapy may soon be available, following the successful trial in Uganda of nevirapine, a new and significantly less expensive antiretroviral ($4 per treatment compared to $60 for a short course of AZT).

In Uganda, nevirapine was given as a single dose to mothers at the start of labor and to their infants within 72 hours after birth. HIV transmission was reduced by 47 percent (14-16 weeks after birth) over those given the short course of AZT.

Food Production Strategies
The labor shortages faced by many households affected by HIV/AIDS may require a rethinking of the labor-intensive food production strategies in hard-hit areas. For example, labor-saving technologies and improved farming practices should be researched, disseminated, and promoted, particularly among women.

Community-Based Care for Orphans
In Kenya and Tanzania, small-scale community-based schemes provide care and support for AIDS orphans. The services range from short-term food supplementation and emergency material support to health care, farm projects, and secondary education.

Such projects must be multiplied and carried out on a larger scale to prevent the growing numbers of children orphaned by the epidemic from falling victim to malnutrition, illness, delinquency, social ostracism, and premature death.

The Challenges Ahead

Implementing promising approaches on a wider scale raises a number of policy challenges. The most significant include:

- the need to expand voluntary counseling and testing services to allow women to learn their HIV status in order to benefit from new interventions
- the high cost of promising new interventions such as antiretroviral therapy
- the need for expanded access to pre-, peri-, and post-natal care to provide and monitor treatment to HIV-infected mothers and their babies
- the high cost of alternatives to breastfeeding and the potential stigma associated with alternative feeding
- the need to provide medical, psychological, and social care to HIV-positive persons and their families
- the economic and psychosocial burden on extended families and hard-hit communities of caring and providing for sick adults and children and for their survivors, particularly AIDS orphans
- the potential for decreased agricultural production, falling incomes, and increased poverty and nutrition in areas heavily affected by HIV/AIDS.

First Steps

The following recommendations can help national health officials and policy makers meet the more immediate challenges associated with HIV/AIDS. These were adopted at a recent meeting on HIV/AIDS and nutrition sponsored by the Commonwealth Regional Health Community Secretariat for East, Central, and Southern Africa (CRHCS/ECSA):

1. Promote breastfeeding among HIV-negative women and those of unknown HIV status, and intensify efforts to prevent HIV infection among women and their partners
2. Enable women to make informed decisions by providing all women of reproductive age with information on mother-to-child transmission of HIV, including the risk of HIV-positive mothers transmitting the virus through breast-feeding, and information on the available feeding alternatives and their risks
3. Develop, test, and disseminate policies and practical guidelines for health workers on:
    a. preventing mother-to-child transmission of HIV
    b. nutrition for people living with HIV/AIDS
    c. voluntary counseling and testing for HIV
    d. replacement feeding for HIV-positive women
    e. infection control policies and procedures for health facilities and traditional birth attendants.
4. Develop and share fact sheets to empower politicians, policy makers, program managers, and service providers to mobilize partnerships for HIV/AIDS prevention and control (including mother-to-child transmission) and for use by the press and to counter misleading information
5. Strengthen the involvement of people living with HIV/AIDS in policy and program interventions to prevent and control the epidemic.

Educational Success Depends on Adequate Nutrition

Better nutrition enhances school enrollment, attendance, and performance, especially for girls. Success in education leads to greater economic productivity in the medium term and to improved health and nutrition for future generations. Formal and non-formal schools also provide opportunities to teach nutrition education and to target nutritional interventions at school-age children most in need.

Better nutrition enhances school enrollment, especially for girls. When children are weakened by poor nutrition and ill health, their capacity to learn is diminished, and they may be forced to end their schooling early or never enroll in school at all.

Conversely, a lack of access to basic education is one cause of malnutrition. Girls and women who face discrimination in education may lack the skills for productive employment and the knowledge that can help them support the health and nutrition of their families.

For many children, schools also can be a haven from the economic, social, and civil problems that affect their households and communities. Schools can provide children opportunities for learning and creativity that they would otherwise lack by providing them with physical safety, clean water, good sanitation, health care, nutritious food, and food supplements. Schools can also equip children with life skills to overcome other problems that may threaten their health and well-being later in life.

School-based treatment of children is especially cost-effective. Schools often provide social services that reach many children at risk for malnutrition or poor health, and they generally provide more effective community outreach than health facilities or clinics.

Girls who stay in school tend to have their first child later in life than those who leave school earlier, and simply delaying childbearing brings myriad benefits to future generations in terms of lower birth rates, better birth outcomes, and improved child health. Furthermore, female literacy is positively associated with reduced infant mortality (see page 2).

Malnourished children enter school later, miss more days of school, have difficulty paying attention and concentrating, and drop out earlier.

Causes and Effects

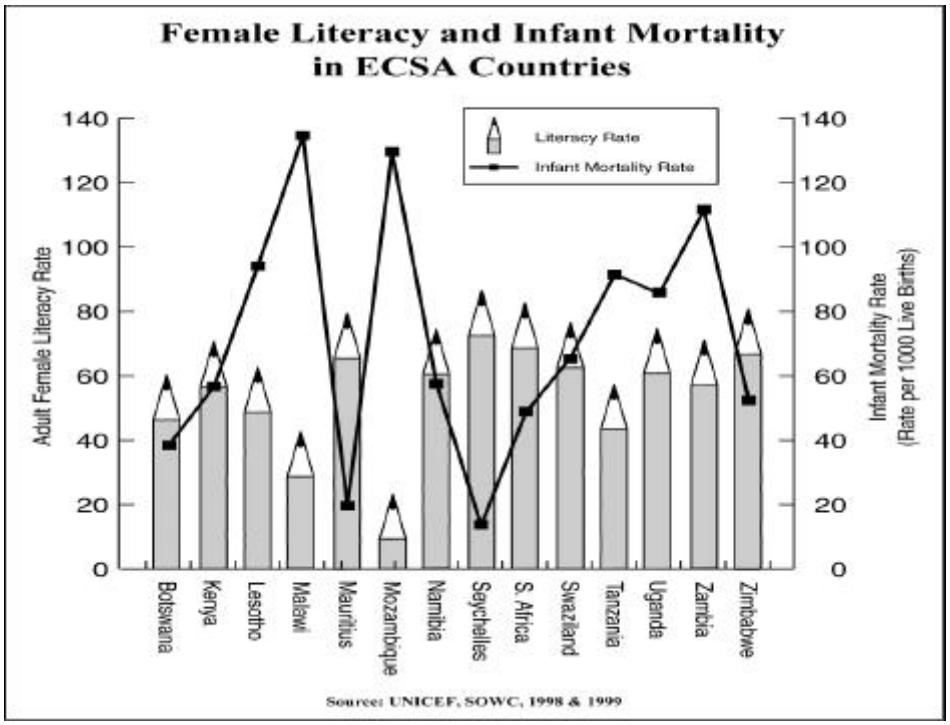
The relationships between nutrition and education are numerous and complex. Several forms of malnutrition increase the risks and severity of illness for children, which affect their ability to attend school and learn.

Protein-Energy Malnutrition (PEM)
Stunting (low height for age) is a primary indicator of chronic malnutrition. It is also an indicator of poor school performance in developing countries. Children who are stunted during their preschool years enroll in school later. Moreover, taller children score higher on tests in arithmetic, reading, spelling, and verbal ability.

Micronutrient Malnutrition
Micronutrient deficiencies are linked to poor school performance throughout childhood. Even moderate vitamin A deficiency can cause vision problems that make it difficult for children to participate in school. More severe vitamin A deficiencies cause mental retardation that can preclude a child from attending school altogether.

Deficiencies of both iodine and iron impair cognitive development and influence children's school attendance and performance. For example, children in Malawi who received iodine supplements showed significantly increased IQs (21 points, on average), and the increase was even greater when they were given iron supplements too.

Helminthic Infection
Parasitic infection, especially hookworm, delays psychomotor development. More severe infection leads to PEM and iron deficiency, which further reduces the chances for the child to attend or succeed in school.



On a global scale, the long-term loss of mental capacity, educational achievement, and economic and social productivity attributable to malnutrition is staggering: over 225 million children under age 5, or nearly 40 percent of all children in this age group, suffer from moderate to severe stunting. In eastern, central, and southern Africa (ECSA), the figure ranges from one-third to one-half.

Approaches that Work

Use school-based programs to implement key health and nutrition interventions. Targeting nutrition interventions to school-age children can help reverse some, though not all, of the ill effects of poor nutrition during infancy and early childhood. The task requires a multisectoral effort that involves parents, communities, nutrition and health workers, and educators.

Focus on Improving School Performance

Improving school children's health and nutrition can improve educational effectiveness. For example, South Africa's Integrated Nutrition Program has been shown to increase children's concentration and decrease absentee ism. The program includes school-based feeding programs, micronutrient supplementation activities, and nutrition education.

Increase Girls' School Enrollment

In many ECSA countries, primary school enrollment of girls lags slightly behind that of boys (see table). In most cases, the gap widens in secondary school. Increasing girls' enrollment and, especially, keeping them in school delays their first birth, increases their marriage age, and improves their lifetime earnings and overall health.

School feeding programs may help keep girls in school. For example, girls' enrollment increased in Ghana when they were given extra food rations take home in addition to their meals at school. Other strategies include ensuring their safety and privacy at school, establishing schools close to home, increasing the number of female teachers, and making school hours more flexible to accommodate work demands on girls.

School Enrollment of Girls, 1990-95

Country	Female Enrollment (% of Male)	
	Primary	Secondary
Botswana	103	105
Kenya	100	78
Lesotho	114	143
Malawi	90	62
Mauritius	99	99
Mozambique	71	63
Namibia	102	120
Seychelles	no data	99
South Africa	98	115
Swaziland	95	101
Tanzania	97	78
Uganda	85	59
Zambia	93	62
Zimbabwe	97	80

UNICEF, SOWC, 1998.

Giving girls a greater awareness of their opportunities for the future can help lengthen and improve their school careers. This can also help improve their self-esteem and give them a sense of empowerment, which in turn reinforces other long-term benefits of education, such as delayed child rearing, better health, and improved income-earning potential.

Teach Health and Nutrition Skills

Integrating nutrition and health messages into the teacher-training curriculum can positively influence health-related attitudes and behaviors among students and their families. The curriculum can include nutrition, family

planning and reproductive health, and services to help postpone first births. Teaching today's young people the skills they need to lead healthier lifestyles can lower their risks of a range of preventable diseases and can improve the health of future generations.

Target the non-formal education-sector

Schools and institutions outside the formal sector should be targeted for the dissemination of key nutrition messages, particularly to women. These include literacy training schools, youth and womens' associations, as well as other training institutions.

Involve the Community

School-based community nutrition programs can effectively deliver both preventive and curative services. These include health and nutrition education, family planning, and micronutrient supplementation, and such curative services as deworming and first aid.

South Africa's school feeding program encouraged the development and support of a range of community-based enterprises that created jobs. In fact, one community in KwaZulu-Natal demonstrated how seven basic microenterprise projects — a piggery, bakery, dairy, poultry farm, vegetable garden, and sewing club — can provide a solid nutritional and economic basis for most every rural community.

Address high-priority problems in a cost-effective manner:

- **Mass application of deworming medications:** Treating all school children helps eliminate any stigma or shame.
- **Delivery of micronutrients, particularly iron and iodine:** Vitamin A capsules cost about 2 cents per dose, and only two to three doses are needed per year per child. A single annual dose of iodine costs just 32 cents, and a year's worth of iron folate tablets costs less than 10 cents per child.
- **Treatment of injuries and routine health problems**: Treating cuts and injuries can prevent infections, and treating other diseases (where feasible) can help slow their spread in the wider community.

Investing in Nutrition Promotes Sustainable Human and Economic Development

Good nutrition is a pre-condition for, rather than merely a result of, human and economic development. Malnutrition in children today slows economic growth and development for decades by increasing illness and mortality and reducing the productivity of tomorrow's labor force. Therefore, investing to improve the nutrition of children and women today is an effective way to improve the living standards of generations to come.

Malnutrition is economically costly, particularly when it occurs among children, because the effects are cumulative over a lifetime. Nutrition deficiencies lead to child deaths, increased health costs to families and the government, decreased mental capacity, and lower future productivity, all of which hinder the economic development of a nation.

The link between economic growth and nutrition cuts several ways. Improved nutrition increases human capacity and fosters economic growth. In turn, increasing food intake and improving nutrition often is best achieved by raising the incomes of poor households.

In fact, malnutrition is both a cause and a consequence of poverty.

Lost Productivity from Malnutrition

Iodine Deficiency Disorders
Among the common types of nutritional deficiencies, iodine deficiency disorders have one of the most severe impacts on learning performance and mental impairment. Iodine deficiency during pregnancy hinders fetal development and can cause significant and irreversible mental and physical damage. The consequences are alarming: reduced mental and physical capacity, resulting in very low economic productivity. But cretinism is just the most visible part of the problem. We now know that in communities affected by iodine deficiencies, virtually all children suffer from mental impairment.

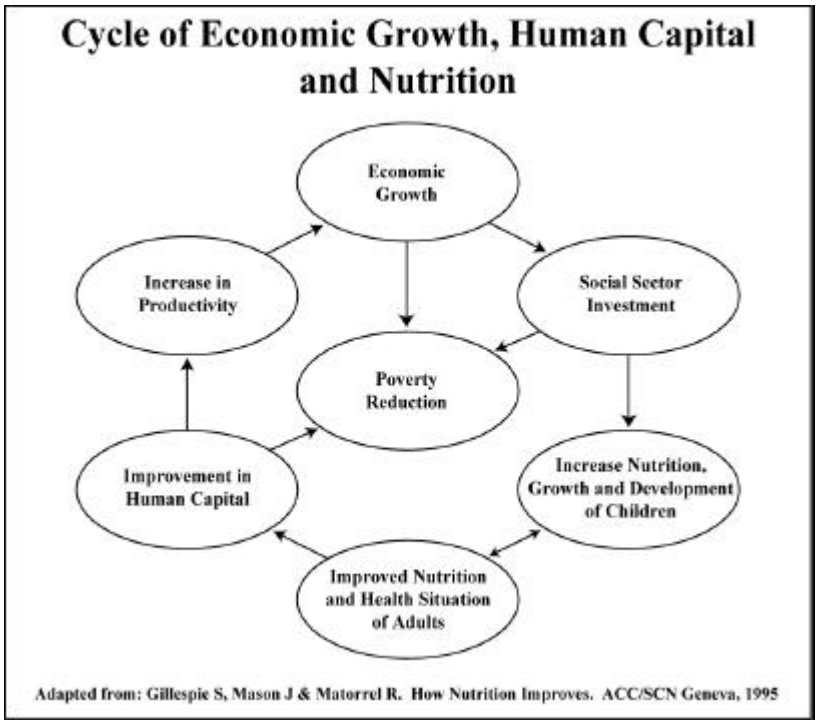
Iron Deficiency Anemia
Low iron reduces the amount of hemoglobin, the oxygen-carrying component of the blood. Iron deficiency results in impaired mental and physical function, including poor fetal development and growth when anemia strikes during pregnancy. In fact, there is conclusive evidence that anemic workers are less productive at physical labor, including agricultural work, than non-anemic workers.

Protein Energy Malnutrition (PEM)
Protein energy malnutrition among children — a failure to grow adequately as a result of the interaction between poor diets and frequent infections— exponentially increases their risks of dying during childhood. These are the findings of studies conducted in five countries, including Malawi and Tanzania.

Another effect of inadequate food intake is stunting, a failure to reach full height. Children who lack adequate nourishment during their first two or three years are stunted for life. When they reach adulthood, their physical capabilities and labor productivity suffer as a result.

One-third to one-half of all children are stunted in most countries of eastern, central, and southern Africa (ECSA). This restricts the potential for growth in productivity, output, and consumption in the region.

In country after country, the economic benefits of nutrition interventions outweigh the costs.



PROFILES: Making the Link

PROFILES is a tool that uses interactive, computer models to demonstrate the potential contribution to human and economic development of improving nutrition. PROFILES projects the consequences of poor nutrition on morbidity, mortality, and health care costs, and estimates the cost savings that can be realized through nutrition programs.

For Uganda, PROFILES showed the dramatic benefits of targeting three severe nutrition problems — iodine deficiency, stunting, and iron deficiency anemia — which together were causing economic losses of $30 million a year.

In Madagascar, PROFILES calculated that the above three nutrition problems as well as sub-optimal breast feeding will result in a total loss of approximately $870 million between 2000 and 2010.

The Cost-Benefit Ratio

The economic value of investing in nutrition may become most clear when the benefits are compared to the costs. In country after country, the economic benefits of nutrition interventions outweigh the costs. In Uganda, every dollar invested in nutrition programs can be expected to yield $1.40 in direct economic benefits.

The Benefits and Costs of Nutrition Interventions in Uganda, 1995

Disorder	Benefits of Eliminating (millions of US$ per capita)	Cost of Interventions (millions of US$ per capita)	Benefit –Cost Ratio
Iodine Deficiency Disorder	16.4	5.8	2.8
Protein Energy Malnutrition	25.6	21.6	1.2
Iron Deficiency Anemia	11.7	11.7	1.0
Total	53.7	39.1	1.4

PROFILES estimations for the World Bank, 1999.

Targeting Nutrition Investment

Income and Nutrition

Higher-income households can buy more food and can also afford a better variety of foods for a more balanced diet. In addition, these households are more likely to utilize clean water and adequate sanitation facilities, and access and afford health service.

For poor households, a rise in food prices or a decline in income generally means a reduction in food intake. Poor households also are more likely to experience seasonal fluctuations in food availability and affordability.

Distribution of Household Income

Nutrition is affected not only by how much money is in the household but also by who controls that money. Income controlled by women is more likely to be spent on better nutrition than income controlled by men, and households with greater control of income by women are more likely to be food secure. Even so, women continue to account for 70-80 percent of household food production in Sub-Saharan Africa,

despite unequal access to land, agricultural inputs, and education and training. Women's lack of access to such resources makes the productivity of their work quite low.

As a result, women in poor households spend much more time working than men, and their work is generally physically demanding. In Zambia, for example, women spend about 14 hours a day engaged in work that requires moderate to heavy energy expenditures. It is common for women to continue with physically demanding work throughout pregnancy.

Intrahousehold Access to Food

Despite their heavy work loads, women often eat less and consume poorer-quality food than the men in the household. This combination of heavy work and reduced food intake has a negative effect on the nutrition of both women and their children, weakening the nutritional status of pregnant and lactating women and their babies, limiting the duration of exclusive breastfeeding, and reducing the time available for food preparation and child care and feeding.

Approaches that Work

Increase income distribution

The most effective national strategy for reducing malnutrition may be to focus on increeasing national income and improving the equity of income distribution.

Improve Women's Productivity

Women are clearly key economic actors in most developing countries. In addition to their primary role in agricultural production, they also are involved in manufacturing, services, trading, and microenterprises — although much of women's economic activity occurs in the informal sector or the home and is therefore not included in official statistics.

Because of women's key roles as economic actors *and* as caregivers, development programs that improve the quality of women's labor and enhance their productivity can yield significant improvements in household food security and nutrition. In Africa, 30-40 percent of households are headed by women. As elsewhere in the developing world, African households headed by women are more likely to be poor, not because women don't work as much but because they lack access to key inputs, including credit.

Improving the quality and productivity of women's work will be accomplished by providing women and girls with greater access to education, enhancing women's skills, developing and distributing appropriate technologies to improve women's productivity inside and outside the home, and empowering women in the legal, social, and economic arenas.

Advocate for Nutrition

Policy makers should advocate strongly for nutrition and its socio-economic consequences (with the help of tools such as PROFILES) as well as invest in the most appropriate and effective strategies to address them.

In this way, they can begin to prioritize nutrition programs and effectively address several of the leading causes of disability and death in the ECSA countries.

In Uganda, the recommendations resulting from Profiles illustrated that a bold new nutrition investment strategy was required to reap benefits to education, agriculture, industry, and to the economic future of the country as a whole.

Agricultural Policies and Programs Can Improve Food Security

The objectives of agricultural policy and production should be to increase food consumption among poor households, generate sustainable livelihoods, and improve the nutritional content of food, not simply to produce crops and livestock. Therefore, agricultural policy must be concerned about improving access to land, agricultural inputs and knowledge, and income, particularly for women.

In many eastern, southern and central African (ECSA) countries, aggregate food supplies are adequate, but chronic and severe malnutrition persists. Many small and medium-sized farmers — who comprise 30-80 percent of the labor force in the region — continue to engage in subsistence production because they lack the skills, tools, and infrastructure to increase their yields. Yet, new promise for improving the output of smaller-scale producers exists, increasing rural incomes, tapping new farm markets, *and* spreading the cultivation of new staple food crops that are naturally rich in key vitamins and minerals.

Household Food Security

Food security refers to the availability, accessibility, and affordability of safe, balanced, and nutritious food through production, distribution, purchase, or exchange at the household level and implies sufficient food for a normal, healthy life for each and every member of the household. Households get food through their own production, by gathering wild food, as gifts from the community, by spending income or assets, and through migration.

The availability of food at the household level is essential for improving nutrition, but is not sufficient. In fact, various non-food factors affect households' ability to translate access to food into nutrition including health and disease, habitat and environment, and the quality and composition of its diet. In fact the household's overall well-being is a product of its food and nutritional security. This concept of overall household "livelihood security" is illustrated in on page 2.

Agricultural Trends in the ECSA Region

Causes of household food insecurity include low agricultural productivity combined with fluctuations in food supply, low incomes, insecure livelihoods, financial shocks (such as death of livestock), war, theft, civil conflict, illness and death.

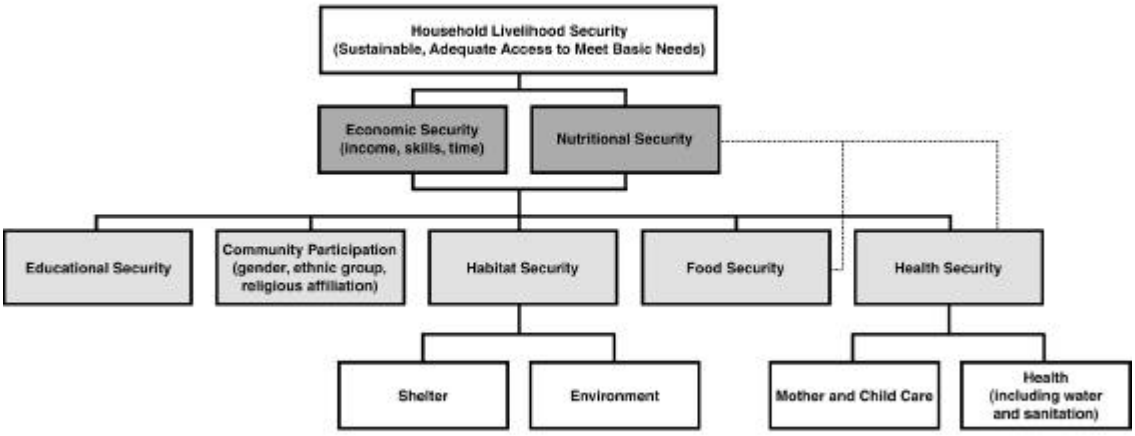
The multi-dimensional nature of household food security partly explains why in many ECSA countries, malnutrition and poverty exists even in times of high agricultural productivity.

Insufficient Food Production

The recent record of food production in Africa has been dismal. From 1980 to 1990, Africa's population grew by 3 percent each year, while agricultural production, growing at just 1.8 percent annually, lagged far behind. With the increase in total population, and the stagnation of the rates of malnutrition (at 30 percent over the last decade), the aggregate number of malnourished children has increased significantly. This extreme and growing gap between the production and the demand for food highlights the need for increased agricultural production so as to adequately feed the populations of the ECSA region.

Zimbabwe has been lauded as a food-secure country with a surplus for export, particularly because its agricultural policies have emphasized domestic self sufficiency as well as regional food security. However, 25 percent of the children under 5 are chronically malnourished (stunted). Studies have shown that most of the food production comes from small geographic areas; commercial farms and resettlement areas, which are not involved in this food production, have high rates of malnutrition. Therefore even if a surplus of food exists most of the time, these households lack sufficient income to buy enough food to eat.

Components of Household Livelihood Security



Source: Adapted from Frankenberger TR, McCaston MK. "The household livelihood security concept," special issue on *Food Security and Community Nutrition*. Food, Nutrition and Agriculture 22, 1998, p. 31.

It is clear that increasing food production is only one dimension of the problem. It is equally important to ensure that all families have *access* to food at all times, either by increasing at-home food production, or increasing their income in order to purchase food.

Inadequate Attention to Women

Although countries in the ECSA region recognize the importance of women in agricultural production, there is little being done to overcome the various constraints that limit their productivity as the main producers and gatekeepers of family welfare.

Women account for 70-80 percent of household food production in much of the region, but generally lack access to resources such as credit and land, technology, and knowledge.

Women's lack of access to such critical resources makes their labor much less productive than men's (although their agricultural productivity equals that of men when they are given access to the same resources). Women therefore must work long hours to generate subsistence levels of food production, leaving them less time to care for their children or themselves. The aggregate impact of these discrepancies is enormous in terms of lost agricultural and economic production, increased household food and nutritional insecurity, and, ultimately, decreased maternal and child health and survival.

Promotion of Cash Crops

Encouraging the production of cash crops, especially for export, has been a major trend in countries in the region. This can serve as a double-edged sword in terms of its effects on household food and nutritional security. On the one hand, improved production techniques can spill over and help raise productivity in the food crop sector. On the other hand, production of cash crops can reduce nutrition if the income generated is not used to purchase food and if land and labor is taken away from food production. For example, food prices may increase if local production falls, and household food security may be reduced when women's labor is used to generate income from cash crops rather than food, because women rarely control how such income is spent. This has been the scenario in several countries in the region.

In the early 1990's, gains from traditional exports (tea and coffee) from **Kenya** decreased significantly and the production of flowers and luxury vegetable production as non traditional exports (NTEs) to help repay the trade deficit was encouraged. As large amounts of water were required to irrigate these flowers, traditional farmers were deprived of water for their crops, local food production decreased, and food prices skyrocketed. This NTE promotion has contributed to the increase in Kenya's unemployment rate, (as traditional farmers and pastoralists were forced to sell their land or migrate into towns), as well as an increase in malnutrition, social disintegration, and increased crime.

Food losses
The commitment by African governments to reducing food losses has been repeated in recent OAU Summits, but this problem has remained largely unresolved. Food losses affect the amount of food available and contribute to the increase of food prices to a level most households can not afford. Food losses occur at various stages: while growing in the field before harvesting, during storage in the post-harvest stage, during transportation, during storage by the trader, while processing, and in the consumer's home. The benefits of reducing food losses range from increasing food and incomes and reducing land under cultivation (to prevent soil erosion). Improving storage, particularly in homes, can reduce food losses by 10-20 percent in many areas.

Production of Inferior Crops
The production of inferior crops in several countries in the ECSA region has increased over the years. For example cassava, which can grow in poor soils, and is less labor intensive than sorghum and millet, has been promoted in much of East Africa. However, cassava is nutritiously inferior to the foods it is replacing, and its promotion, in the long run, can have negative effects on the population's nutrition status.

Approaches that Work

Integrate Strategies
In general, agricultural policy best promotes food and nutritional security when it is integrated into an overall, multisectoral strategy. For example, horticultural and agricultural extension services should be complemented by nutrition education and beneficial land-use regulations.

New Orange- and Yellow-Fleshed Sweet Potatoes in Kenya

Sweet potatoes are widely cultivated and, following maize, are a staple food in many countries in eastern and southern Africa. The orange-fleshed varieties can be easily cultivated year-round in many areas and have proven to be drought-resistant. Furthermore, sweet potatoes are considered a "women's crop," because women plant them on small plots of land and generally keep much of their harvest for home consumption. When they do sell some of their crops, the income tend to remain under the control of the women producers.

This was the case in Kenya, where the orange-fleshed sweet potatoes were recently introduced into several villages in the western part of the country, the primary sweet potato-producing region of the country. The goal was to increase the dietary intake of vitamin A among children, and so villagers were taught new recipes for using the sweet potatoes (particularly for weaning foods for young children). They were also trained to process and market sweet potato-based foods to generate income. Moreover, many of the women producers used the home visits by project fieldworkers to review nutrition lessons and reconcile these with their cultural beliefs and practices.

Balance food for export and food for domestic consumption
Policy makers should ensure that agricultural policies focus on assuring sufficient production for their countries. In additoin, great attention should be paid to the economic, social and environmental consequences of export diversification.

Involve women in planning and implementing agricultural projects
Because women have primary responsibility for producing, processing, and cooking food for members of their household, interventions should target activities under women's control — for example, introducing improved varieties of crops traditionally cultivated by women (on land under their control) and providing education and technology for better food storage and preparation.

Safeguard women's land rights
This can be achieved through non-discriminatory registration and titling, as well as the inclusion of women as sole or joint beneficiaries in land reform programs and can have a positive impact on household livelihood security.

Produce traditional, nutritious foods
Measures to expand production and consumption of traditional foods such as roots, tubers, pulses, and legumes can be particularly effective. Many traditional foods serve as staples, and increasing their production can improve food supplies for groups particularly vulnerable to undernutrition. Most traditional foods also are well adapted to the local environment and provide year-round supplies. Furthermore, traditional crops are often produced, processed, and marketed by women, and increasing their production can increase the incomes of these women.

Improve women's access to agricultural inputs and extension services

Improving tools, resources and services, particularly for women, is key to increasing the adoption of new technologies as well as reaching adequate productivity gains in agriculture. These include new varieties of seed for crop diversification, fertilizer, labor saving technologies and tools, and knowledge about more ecologically sustainable practices.

Increase Income-Generating Opportunities

Creating off-farm employment can improve living standards for many members of a community. Small farmers tend to spend additional income on locally produced goods and services, and women tend to use their income to provide improved nutrition, education, or health care for members of their household.

Improve drying and storage techniques

This can not only improve the *supplies* of food for these groups; they can also improve the *quality* of foods by preserving the micronutrient content and preventing production of toxins and bacteria.

Encourage Traditional Gardening

Home and community gardening improves household food security by providing direct access to food that can be harvested, prepared, and fed to the family on a regular, even daily, basis. The practice is ancient and widespread, even in urban areas.

For example, in 1991, 67% of households in Tanzania's capital, Dar es Salaam, gardened. Poor people garden on small patches of land; the landless use containers or school and community gardens.

Traditional gardening uses few resources and low-cost technology. The gardens can be adapted to reflect local growing conditions, resource availability, and customs and traditions.

Provide extension services that link agriculture and nutrition

Agricultural programs must be supported by health and nutrition education and by extension services to assist in cultivation, harvest, and processing of food. Agricultural extension workers therefore need training to improve the links between agricultural production and improved food consumption.

Involve the Community

Including men and other community members in activities to improve the production and consumption of wholesome foods can help spur behavior change at the household level. School students, especially girls, should also be taught skills to improve basic health, nutrition, and food security at the household level.

Collaborating with Private Industry to Combat Malnutrition

Strong partnerships between the public and private sectors can be an important weapon in the fight against malnutrition. The private sector can be a valuable partner to the public sector in planning and implementing food fortification and supplementation programs, two important strategies for combating micronutrient deficiencies. In particular, private industry brings a wealth of experience and expertise in product packaging and positioning, advertising, communications, and social marketing.

Over the long term, the most sustainable and effective means of reducing or eliminating deficiencies in vitamin A, iron, iodine, and other key micronutrients is to build and expand markets for micronutrient-rich foods. This involves increasing the supply (production) and demand (consumption) of such foods and ensuring their affordability and safety.

Two other strategies are available to address the more immediate need to correct existing micronutrient malnutrition, while advancing the long-term objective of expanding the availability and consumption of micronutrient-rich foods. These two strategies are:

- **Food fortification:** the addition of vitamins and minerals to widely consumed foods, usually staples such as salt, sugar, flour, milk, cooking oils, and cereals
- **Supplementation:** the extra-dietary provision of key vitamins and minerals, generally in the form of injections or capsules.

These approaches are inexpensive and cost-effective (see page 2). In most countries, fortified foods and supplements are generally available through commercial distribution channels and through the public health system. Both methods of distribution, however, require close collaboration between the food and pharmaceutical industries and public health and regulatory agencies. Thus, a long history of public-private partnership in this area exists, despite some fundamental differences in the priorities and approaches of the key players.

> Food fortification and supplementation are cost-effective strategies for correcting existing malnutrition while helping expand the availability and consumption of micronutrient-rich foods.

Public-Private Partnerships for Fortification

The Success of Salt Iodization

Growing evidence from around the world shows that food fortification is highly effective in reducing deficiencies of iron, iodine, and vitamin A when supported by complementary programs and policies in the health, agriculture, trade, and food-processing sectors.

One great success has been the virtual elimination of iodine deficiency in most industrialized countries and the commitment of most developing countries to iodize their entire salt supplies within the next few years. This success has been the result of the hard work of dedicated international policy makers, child health advocates, and salt producers.

The Role of Legislation

In many countries, successful salt iodization and other food fortification efforts have been undertaken only after the passage of national legislation or regulations for mandatory fortification. Fortified foods are more expensive to produce and therefore carry a higher price tag and, often, lower profit margins. In some areas, the market for such products may be undeveloped or untested, which heightens the risks for food producers and distributors. Mandatory fortification can level the playing field.

In addition, mandatory fortification programs can spur collaboration among the public health sector and industry to

develop better products, launch social marketing campaigns to build demand for fortified products, and overcome logistical barriers to efficient production and distribution of fortified products.

Supplementation

Pharmaceutical supplementation programs are necessary to meet the short-term needs of groups suffering from or at high risk for micronutrient malnutrition. Historically, however, the effectiveness of such programs has been weakened by complicated logistics and low coverage and compliance among the population segments most at risk.

Enlisting the help of private pharmaceutical firms may increase the effectiveness of these critical programs. For example, one reason for low compliance with supplementation is a lack of products that are suitable and/or appealing. Private firms have significant expertise in producing effective products with safe, attractive, and easy-to-use packaging, with helpful labeling, in appropriate doses, and at affordable prices.

One successful means of broadening the coverage of supplementation programs is to use schools, and especially school feeding programs, as the locus for delivering supplements. This approach, which has proven effective in South Africa and elsewhere, also requires the cooperation and involvement of both the public and private sectors.

Over the long-term, food-based approaches are the most cost-effective and sustainable means of combating micronutrient malnutrition. National nutrition strategies should emphasize food fortification and educational and communication efforts that gauge and build community and political support for improved nutrition-related behaviors. Targeted supplementation should continue to be used to meet the needs of vulnerable and high-risk groups, including pregnant women, new mothers, and children. All efforts in this area should be complemented by other food-based approaches, such as:

- **Agricultural policies** that promote crop diversification, agroforestry, and production of traditional and wild foods
- **Horticultural and extension services** that encourage the production and safe preservation and processing of fruits and vegetables
- **Land-use regulations** that support household and community gardening activities, even in urban areas.

Such an integrated strategy is most effective and sustainable over the long run because it is preventive (encourages dietary behavior change) and adaptable (appropriate for large groups with various cultural and dietary traditions). It also addresses broader issues of food security and can generate income for households and communities.

Most important, however, such an integrated strategy serves the ultimate objective of building sustainable, environmentally sound, food production systems, in at least three ways. First, it creates consumer demand for safe, wholesome foods. Second, it helps sensitize agricultural planners and producers to the need to protect the micronutrient content of soil and crops. Third, it spurs partnerships among governments, consumer groups, the food industry, and others to overcome micronutrient malnutrition.

The Cost-Effectiveness of Fortification and Supplementation

Intervention	*Target Group*	*Approximate cost (US dollars)*	
		Per death averted	*Per DALY* saved*
Iron supplementation	Pregnant women	800	13
Iron fortification	Entire population	2,000	4
Iodine supplementation	Women of reproductive age	1,250	19
Iodine supplementation	Entire population	4,650	37
Iodization of salt or water	Entire population	1,000	8
Vitamin A supplementation	Children under 5	50	1
Vitamin A fortification	Entire population	154	4
Food supplementation	Children under 5	1,942	63
Food supplementation	Pregnant women	733	24

* disability-adjusted life year

World Development Report 1993: Investing in Health, Washington, DC, World Bank, 1993,

Behavior Change Communications

Increasing the supply of fortified foods and vitamin and mineral supplements is only half the battle; the other half is to encourage people to consume them.

Private industry can help the public sector combine effective communication strategies with appropriate social marketing interventions to improve results. Fortification efforts can benefit from targeted market research and effective and appealing packaging. Compliance rates for supplementation programs could be increased by improving the appeal of tablets.

Furthermore, private industry could help build effective messages for key nutrition behaviors into new or existing programs. These could include the importance of exclusive breastfeeding and the need for appropriate feeding of children during and after illness.

Health ministries and donors have worked closely with commercial firms in recent years to build viable markets for some simple, low-cost, commercially available health products that can prevent millions of deaths each year, particularly among children. The focus so far has been on hand soap to prevent diarrheal disease, oral rehydration salts (ORS) to prevent dehydration from diarrhea, key fortified foods, and insecticide-treated bednets to prevent mosquito-borne malaria.

These partnerships often tap the branding, marketing, advertising, and distribution expertise of the private firms to develop educational and promotion campaigns that effectively reach the key target audiences. The public sector often contributes key data about the existing and potential market for such products drawn from demographic and health data, field programs, and government-funded research. In addition, the public sector partners often reduce the risks and costs associated with launching new products or promotions by offering tax breaks, subsidies, and research support.

Approaches that Work

Collaborate the private and public sectos to launch fortification ventures

This generally requires collaboration between the public sector and one or more commercial food or agricultural companies. Such public-private partnerships help ensure that the effort fulfills the following criteria for success:

- **Create public awareness**
  Building a market for fortified foods requires informing the public about the risks and prevalence of micronutrient malnutrition and the role that micronutrient-rich foods can play in promoting health and productivity.

- **Use market research**
  When fortified food products fail in the marketplace, the reason is often because they are developed using public health data on the prevalence of micronutrient malnutrition, Instead, such products should be developed, priced, packaged, and promoted using market data on food purchasing patterns, the size of the market, consumption habits.

- **Segment the market**
  The commercial sector seeks to maximize profits, and the public sector seeks to maximize reach or coverage. A good starting point for fortification efforts is to target the 80 percent of the population in the middle of the economic spectrum. This way, the commercial sector can position target other, higher-priced foods to consumers who can afford them, and the public sector can target other nutrition interventions (e.g., supplementation) to more needy groups.

Tap the private sector's expertise in social marketing

The private sector can implement dynamic social marketing programs to effectively target specific nutrition and health messages to audiences that would not otherwise have access to such information.

Enlist the private sector to improve sustainability

Private sponsors and partners can ensure adequate funding, staffing, and support for important programs. For example, The Valley Trust, a private firm in South Africa's KwaZulu-Natal Province is supporting an integrated nutrition program that includes school-based nutrition education, support for home and community gardening and other measures to improve food security. In another South African province, Gauteng, the Kellogg Company is facilitating a primary school nutrition program.

Public-Private Partnerships for Fortification in ECSA

Until recently, conventional wisdom was that food fortification was impractical in Africa, in particular because only limited central processing of food existed in most countries. However, the food industry has been working with donors and governments to develop and test new technologies and approaches, with great success.

Mozambique: The Government of Mozambique is linking vitamin A supplementation efforts to national immunization days (NIDs) and is exploring the possibilities for fortification.

Namibia: A commercial miller is fortifying maize meal with vitamin A, the B-complex vitamins, and iron. UNICEF helped launch the program, and initial consumer demand has been high.

South Africa: South Africa has a highly developed industrial sector and widespread demand for fortified foods. Fortification of margarine with vitamins A and D is now mandatory, and enrichment of maize meal with vitamin B_2 and niacin has been promoted for over 20 years (although compliance with enrichment guidelines has not been closely monitored). The focus is now on ways to make fortification feasible in small food-processing facilities.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